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T O P S E C R E T 182340Z OCT 68 CITE [redacted] 4858. 25X1
PRIORITY [redacted] 25X1
SECTION ONE OF TWO
CORONA
REF: A [redacted] 0896
B [redacted] 0950

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SUBJECT: MISSION 1048 PHOTOGRAPHIC EVALUATION INTERIM REPORT (PEIR)

1. NUMERICAL SUMMARY

MSN NO. AND DATES:	1048-1, 18-27 SEPT 1968
	1048-2, 28 SEPT - 2 OCT 1968
LAUNCH DATE AND TIME:	18 SEPT 1968/2132Z
VEHICLE NUMBER:	1647
CAMERA SYSTEM:	J-49
PAN CAMERA NUMBER:	FORWARD LOOKING, 222
	AFT LOOKING, 223
MISSION 1048-1 S/I NO:	121/155/160
MISSION 1048-2 S/I NO:	116/147/136
RECOVERY REVS:	
MISSION 1048-1	REV 145, 28 SEPT 1968/0010Z
MISSION 1048-2	REV 224, 2 OCT 1968/2305Z

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2. CAMERA SETTINGS:

FWD LOOKING	SLIT 0.200 FILTER W/23A
AFT LOOKING	SLIT 0.150 FILTER W/21

3. PERFORMANCE SUMMARY:

THE PHOTOGRAPHY FROM THIS MISSION SHOWS A VARIATION IN QUALITY RANGING FROM GOOD TO THAT OF LESS THAN NORMAL QUALITY. THE QUALITY VARIATION APPEARS TO BE LARGELY ASSOCIATED WITH SMEARED IMAGERY CAUSED BY UNCOMPENSATED CROSS-TRACK MOTION AND/OR CAMERA VEHICLE MOTION. WHEN COMPARING THE FORWARD AND AFT IMAGERY THE AFT IS CONSISTENTLY SUPERIOR WITH SOME IMAGERY EQUAL TO THE BEST OBTAINED WITH THE 1000 SERIES. READING FROM THE ORIGINAL NEGATIVE IMAGERY A FIXED TARGET YIELDED [redacted] IN THE CROSS-TRACK DIRECTION.

THE OVERALL INTERPRETABILITY OF THIS MISSION IS FAIR. THE PI'S REPORTED THE AFT CAMERA RECORD AS GENERALLY GOOD FOR INFORMATION CONTENT; HOWEVER, THEY FELT THE FORWARD CAMERA RECORD WAS POOR TO [redacted] FAIR, WITH THE LOSS OF STEREO ON PASSES D182 THRU D216 AS ANOTHER FACTOR CONTRIBUTING TO THE FAIR RATING.

A FAILURE OF THE FORWARD CAMERA OCCURRED DURING PART TWO WITH ONE-THIRD OF THE FILM USED. THE CAUSE OF THIS FAILURE HAS NOT BEEN

IDENTIFIED. SEE REMARKS.

FUAL GAMMA PROCESSING OF THE PANORAMIC CAMERA MATERIAL ENABLED US TO OBSERVE EXAMPLES OF HIGH BRIGHTNESS OBJECTS THAT HAVE NOT BLOOMED FROM VERY HIGH DENSITY.

4. ANOMALIES:

A. ANOMALY: THE NUMBER TEN LIGHT ON THE FWD CAMERA BINARY BLOCK CAME ON AT RAMDOM DURING THE MISSION.

CAUSE: THIS ANOMALY WAS NOTED DURING HIVOS TESTING. THE PROBLEM WAS CONSIDERED TO BE A LOOSE CONNECTION AND SUBSEQUENTLY REPAIRED. THE LAMP ANOMALY DID NOT OCCUR DURING THE REMAINDER OF GROUND TESTING. THE PROBABLE CAUSE APPEARS TO BE THE CLOCK SIGNAL TO THE NUMBER TEN BIT.

ACTION: NONE

B. ANOMALY: THE END AREAS OF THE FORWARD FORMATS HAD A LARGER THAN NORMAL SOFT AREA.

CAUSE: WHEN THE FILM TRACKS WITH A BIAS TO ONE RAIL IT CAUSES A FILM PLANE CHANGE, WITH SOME LOSS IN IMAGE QUALITY. THESE AREAS CHANGED IN SIZE THROUGHOUT THE MISSION, RANGING FROM LARGER THAN NORMAL TO NORMAL.

ACTION: CONTINUED MONITORING OF THE VEHICLE INTERFACE

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MOUNTING TO THE CAMERA MAIN PLATE TO MINIMIZE PLATE DISTURBANCES. NO OTHER ACTION RECOMMENDED.

C. ANOMALY: TWO ROWS OF PLUS DENSITY SPOTS ARE PRESENT THROUGHOUT THE AFT LOOKING CAMERA RECORD FROM MISSION 1048-1. THE SPOTS ARE LOCATED ONE INCH AND 1.1 INCHES RESPECTIVELY FROM THE TIME TRACK EDGE OF THE FILM AND THE SPACING BETWEEN THE SPOTS IS 2.3 INCHES.

CAUSE: THIS ANOMALY OCCURRED AS A RESULT OF FOREIGN PARTICLES IN THE MISSION 1048-2 TAKE-UP HUB ROLLERS. AS THE MATERIAL PASSED THROUGH THE HUB IT WAS MARKED IN A REPETITIVE PATTERN.

ACTION: THIS ANOMALY IS CONSIDERED AS PART OF THE PREVIOUSLY REPORTED CHARACTERISTIC PROBLEMS ASSOCIATED WITH THE CORONA SYSTEM. NO ADDITIONAL ACTION RECOMMENDED.

D. ANOMALY: A LONGITUDINAL PLUS DENSITY LINE NEAR THE RAIL SCRATCHES ALONG THE TIME TRACK EDGE OF THE FILM AND TWO PLUS DENSITY LINES BETWEEN THE RAIL SCRATCHES AND TIME TRACK APPEAR ON THE AFT LOOKING CAMERA MATERIAL FROM MISSION 1048-2.

CAUSE: THIS LINE IS AN EXPOSURE CAUSED BY AN ELECTRO-STATIC DISCHARGE. THE LINE DIMINISHED ON THE FIFTH FRAME OF A PASS AND STARTS AGAIN ON THE SIXTH FRAME WHICH INDICATES THE CONSTANT TENSION ASSEMBLY AS BEING THE PROBABLE POINT OF OCCURRENCE.

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ACTION: THIS IS THE FIRST REPORTED OCCURRENCE OF THIS ANOMALY. NO ACTION RECOMMENDED.

E. ANOMALY: THE STELLAR/INDEX CAMERAS OF MISSION 1048-1 EXPERIENCED DOUBLE EXPOSURE ON FRAMES 92 AND 363. IN ADDITION THE S/I CAMERAS OF MISSION 1048-2 EXPERIENCED A TRIPLE EXPOSURE ON FRAME 01, A DOUBLE EXPOSURE ON FRAME 03, AND FRAME 102 CONTAINED FIVE EXPOSURES.

CAUSE: THESE MULTIPLE EXPOSED FRAMES OCCUR AS A RESULT OF AN APPARENT LOSS OF EFFICIENCY IN THE S.I. DRIVE MOTOR DUE TO A SLIGHTLY HIGHER BUS CURRENT DRAIN AT THE FASTER SCAN RATES. AT THE HIGHER V/H RATES THERE IS NOT ENOUGH TIME ALLOTED FOR THE PLATEN TO LIFT THE REQUIRED DISTANCE TO TRIP THE METERING SWITCH BEFORE THE METER COMMAND IS INITIATED. THE PRESENT CAM REQUIRES THE PLATEN TO BE LIFTED APPROXIMATELY 95 PERCENT OF ITS TOTAL TRAVEL BEFORE THE METERING SWITCH IS ACTUATED. THE PRESENT DRIVE MOTORS ARE DESIGNED TO OPERATE AT 37 RPM AND A LOSS OF 1 RPM COULD CONCEIVABLY CAUSE THE ANOMALY DESCRIBED.

ACTION: THE PRESENT CAM HAS APPROXIMATELY A TEN DEGREES DWELL TIME. INSTALLING CAMS WITH A MUCH LARGER DWELL WOULD ALLOW THE METERING SWITCH TO BE TRIPPED EARLIER IN THE PLATEN TRAVEL, THUS

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ALLOWING COMPLETION OF A NORMAL CYCLE AT OPERATIONAL V/H RATES. THIS CORRECTION IS PRESENTLY BEING PROCESSED FOR ALL FUTURE SYSTEMS.

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F. ANOMALY: TRACES OF DENDRITIC STATIC ARE DETECTABLE AT RAMDOM THROUGHOUT THE MISSION ON BOTH CAMERA RECORDS.

CAUSE: THE MAJORITY OF THIS MARKING OCCURRED DURING GROUND HANDLING. WHILE IN FLIGHT, THE AFT CAMERA FILM RECORD WAS OCCASIONALLY MARKED AT 6.3 INTERVALS BY DENDRITIC TYPE STATIC DISCHARGES. THE STATIC WAS DISCHARGED THROUGH A FOREIGN PARTICLE EMBEDDED IN THE METERING ROLLER.

ACTION: A CONTINUING EFFORT IS MAINTAINED FOR PREVENTION OF FOREIGN PARTICLES IN THE SYSTEM.

G. ANOMALY: LIGHT LEAKS OF VARYING INTENSITY AFFECTED SOME FRAMES OF BOTH CAMERA RECORDS ON MOST PASSES. ON FORWARD CAMERA OPERATIONS, THE LAST, NEXT TO LAST, AND FIFTH FRAMES WERE OFTEN AFFECTED. ON AFT CAMERA OPERATIONS, THE THIRD FROM END, AND FOURTH AND FIFTH FRAMES WERE AFFECTED. THE INTENSITY OF THE MARKING WAS PROPORTIONAL TO THE LENGTH OF THE SET TIME AND WAS NOTED AS BEING MINOR.

CAUSE: EXCEPT FOR ONE VERY FAINT DIFFUSE MARK, ALL LIGHT LEAKAGE CAN BE TRACED TO CHARACTERISTIC CAMERA DRUM SOURCES WHICH CAN NOT BE COMPLETELY ELIMINATED WITHOUT FUNCTIONAL HAZARD TO THE CAMERAS. THE EXCEPTION NOTED MAY BE DUE TO A DRUM LEAK OR A SMALL LEAK OF THE FORWARD CAMERA OUTPUT HORIZON CAMERA BOOT.

ACTION: THE EXTENT OF LIGHT LEAKAGE OBSERVED IN THIS MISSION IS CONSIDERED TO BE WITHIN SYSTEM CONTROL LIMITS. NO SPECIFIC ACTION IS RECOMMENDED. IT IS NOTED THAT A/P IS CURRENTLY REVIEWING LIGHT LEAKAGE TEST METHODS AND PROCEDURES TO ASSURE CONTINUING ADEQUATE CONTROL.

H. ANOMALY: AN OBSTRUCTION OF VARYING LENGTH AND WIDTH IS PRESENT ON FRAMES 08 THROUGH 159 OF THE INDEX CAMERA, RESEAU NUMBER 147, FROM MISSION 1048-2.

CAUSE: THE IMAGE OF THIS OBSTRUCTION IS OUT OF FOCUS AND ITS RELATIVE POSITION CHANGES SLIGHTLY THROUGHOUT THE MISSION. THE OBSTRUCTION APPEARS TO BE A PIECE OF THERMAL TAPE, EXTERNAL TO THE CAMERA, THAT BECAME DISLODGED DURING THE MISSION.

ACTION: CONTINUE CLOSE INSPECTION OF THERMAL TAPE PRIOR TO FLIGHT. (MONITOR [redacted] 25X1

I. ANOMALY: THE TIME TRACK OF BOTH CAMERAS IS MISSING AT THE

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BEGINNING OF SCAN ON THE FIRST FRAME OF MOST OPERATIONS.

CAUSE: IT APPEARS THAT THE PREVIOUSLY REPORTED DARK EFFECT PHENOMENON, THOUGH CONSIDERABLE CURTAILED, HAS NOT BEEN ELIMINATED. AS DESCRIBED IN EARLIER REPORTS, THE NEON LAMPS APPEAR TO NEED A SLIGHTLY HIGHER VOLTAGE LEVEL TO INITIATE FIRING AFTER EXTENDED PERIODS OF INACTIVITY IN DARK AREAS. THE FINAL CIRCUIT IMPROVEMENT WAS EFFECTED ON THIS SYSTEM PRIOR TO FLIGHT.

ACTION: THE USEFULNESS OF THE FIRST FRAME OF EACH PASS IS LIMITED DUE TO SLOW SCAN RATE DURING CAMERA START UP. THE LOSS OF THE TIME TRACK IN THIS AREA IS CONSIDERED OF LITTLE CONSEQUENCE. NO ADDITIONAL ACTION IS RECOMMENDED AND THIS ANOMALY WILL BE CONSIDERED CHARACTERISTIC FOR FUTURE J-1 SYSTEMS.

J. ANOMALY: THE HORIZON CAMERAS ON THE FWD CAMERA DID NOT OPERATE ON FRAMES 86, 88, 90, 92 OF PASS D84. THE HORIZON CAMERA FIDUCIALS WERE NOT IMAGED ON FRAMES 86, 88, 90 BUT WERE IMAGED ON FRAME 92.

CAUSE: RELAY K105, WHEN ENERGIZED SUPPLIES UNREGULATED VOLTAGE TO THE HORIZON CAMERA SHUTTER SOLENOIDS THRU ONE SET OF CONTACTS AND A REGULATED VOLTAGE PULSE TO THE HORIZON CAMERA FIDUCIALS THRU THE OTHER SET OF CONTACTS. BECAUSE OF THE INDEPENDENT

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POWER SOURCES AND THE MANIFESTATION OF THE FAILURE, THE ONLY INDEPENDENT FAILURE MODE COMPONENT IS THE CONTACTS OF RELAY K105.

ACTION: REVIEW THIS COMPONENT FAILURE HISTORY AND CIRCUIT TO RECONFIRM ITS RELIABILITY. (MONITOR: [redacted] 25X1

K. ANOMALY: THE BINARY BLOCK IS MISSING ON FRAME 16 FWD OF PASS D40, FRAME 113 FWD OF PASS D53 AND ON FRAME 109 AFT OF PASS D84.

CAUSE: IN ALL CASES THE SERIAL NUMBER, SERIAL INDEX, AND THE NUMBER 30 INDEX WAS IMAGED ON THE MATERIAL. THE ANOMALY WAS NOTED ON TWO OCCASIONS IN THE HIVOS TEST AND IS ASSOCIATED WITH THE CLOCK FAILURE TO RECEIVE OR ACT UPON THE INTERROGATE COMMAND.

ACTION: THIS IS NOT CONSIDERED A FAILURE BUT A PERCULIARITY OF THE CLOCK AND READOUT SYSTEM. NO ACTION RECOMMENDED.

L. ANOMALY: THE FORWARD CAMERA FAILED ON REV D181 WITH SIX INCHES OF FRAME 70 BEING THE LAST RECOVERED PHOTOGRAPHY. POST FLIGHT ANALYSIS INDICATES THE CAMERA DRIVE SYSTEM WAS DISCONNECTED FROM THE DRIVE MOTOR ASSEMBLY. THE FAILURE PREVENTED ELECTRICAL SHUT

DOWN OF THE CAMERA WHICH RESULTED IN THE MAIN DRIVE MOTOR BEING CONTINUOUSLY POWERED. THE RECOVERED TAIL END OF FILM WAS NOTED TO BE A TEAR AND NOT A WATER SEAL CUT.

CAUSE: A POSSIBLE CAUSE IS A MECHANICAL FAILURE IN THE MAIN

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DRIVE ASSEMBLY. THREE MAJOR AREAS OF DATA SUPPORTING THIS FAILURE MODE ARE:

(1) TELEMETRY DATA INDICATED THE MAIN DRIVE MOTOR AND TACHOMETER ASSEMBLIES WERE INTACT AFTER THE FAILURE, WITH OPERATE POWER CONTINUOUSLY ON. THE TACH ALSO RESPONDED TO V/H VOLTAGE CHARGES.

(2) THE LENS DRIVE AND FILM METERING CONTROL LINKAGE WERE INOPERATIVE.

(3) VEHICLE ATTITUDE DATA INDICATED A NORMAL INSTRUMENT COAST DOWN AT TIME OF FAILURE. A TRANSIENT LOAD ON THE DRIVE ASSEMBLY CAUSED BY ADHESIVE SEEPAGE AT A MANUFACTURER'S SPLICE, LOCATED 152 FRAMES PREVIOUS TO THE FAILURE, COULD BE A CONTRIBUTING FACTOR. A TRANSIENT LOAD COULD HAVE PARTIALLY FRACTURED A PIN OR PINS IN THE CAMERA DRIVE SYSTEM.

COMMENTS:

(1) OTHER FAILURE MODES WERE ANALYZED BUT NOT CONSIDERED AS LIKELY AS THAT DESCRIBED ABOVE.

(2) THE CONDITION OF THE DAMAGED FILM IN THE 1048-2 BUCKET IS CONSIDERED TO BE AN EFFECT AND NOT A CAUSE OF THE FAILURE.

(3) THE TIME OF THE FILM TEAR, IN RELATION TO KNOWN CAMERA

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PARAMETERS, INDICATE THE TEAR PROBABLY OCCURRED AFTER THE CAMERA SHUT DOWN. AN EXHAUSTIVE ANALYSIS OF TELEMETRY AND FLIGHT FILM HAS FAILED TO REVEAL THE DIRECT CAUSE OF THE FILM TEAR. A FULL TEST PROGRAM IS NOT FEASIBLE DUE TO RISK INVOLVED WITH THE NECESSITY OF USING FLIGHT HARDWARE FROM A FUTURE MISSION; HOWEVER, LIMITED TESTS WILL BE CONDUCTED TO DETERMINE WHAT AREAS WITHIN THE FILM PATH COULD CAUSE THE FILM TO TEAR IN A MANNER SIMILAR TO THAT EXPERIENCED IN FLIGHT. (MONITOR: [redacted] 25X1

M. CHARACTERISTIC ANOMALIES: THERE ARE CERTAIN PREDICTABLE ANOMALIES WHICH OCCUR ON A REGULAR BASIS AND ARE CONSIDERED AS INHERENT IN THE CORONA J-1 SYSTEMS. AMONG THOSE NOTED IN MISSION 1048 ARE: MINOR LIGHT LEAKS IN THE DRUM AND BARREL INTERFACE AREAS, DENDRITIC STATIC MARKINGS, MINOR BANDING, AND EMULSION CRACKING.

END OF MESSAGE